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DCGS-IC Study

GSAW 2009

SOA Thread



Study Purpose

- ▶ **Background:** Concerns have been communicated that DCGS-IC is not open or SOA enough. Specifically, S/W will not interface with DCGS-IC based on “open” standards and “SOA” principles.

- ▶ **Problem Statement:** What are the SOA and open measures and what is conformance or maturity level that is appropriate for DCGS-IC

- ▶ **Deliverable:**
 - Aerospace and MITRE coordinated Study
 - Presentation Overview of Study
 - Create a repeatable process to evaluate other SOA products

Study method repeatable as needed

Method

- ▶ Team: Made up of joint NRO FFRDC (MITRE and Aerospace) personnel to provide an unbiased review of DCGS-IC

- ▶ References: Industry and DoD

- ▶ Methodology
 - Defined the “SOA-ness” and “Open-ness” of DCGS-IC
 - Created “SOA-ness” and “Open-ness” measures
 - Determined the DCGS-IC SOA and open conformance or maturity level.
 - Evaluated DCGS-IC against “SOA-ness” and “Open-ness” measures.

- ▶ Interviewees
 - NGIT
 - NRO SME’s

Assumptions and Disclaimers

- ▶ Methodology was required that would be objective, straight forward, and repeatable to derive questions regarding: SOA-ness, Openness, degree to which meets well-defined need, etc...
- ▶ Gov't furnished System Engineering resources were used to conduct alternative analysis and trade-off to ensure that no competing implementation DCGS-IC capabilities are available
- ▶ Next version of DIB will address any shortcomings that the assessment uncovers
- ▶ Vendor provided accurate responses to their best effort
- ▶ Gov't followed appropriate acquisition procedures and provided supporting documentation for prototyping
- ▶ References and criteria were appropriate for the level of analysis. A high-level analysis was conducted with no code-level walk through.
- ▶ SOA-ness and Open-ness are subjective and based on maturity and system objective and not yes/no
- ▶ Existing guidance or documents to leverage that would define SOAness and Open-ness
 - OASIS RM
 - OASIS SOA RA (Draft)
 - NESI

Findings

Scores reduced by inability to fully evaluate DCGS-IC Line by

line code review needed, POR requirements needed...

SOA	48%	← 1 2 3 4 5 →					No "All Green" scores in IC
		0-20%	21-40%	41-60%	61-80%	81-100%	
Service characteristics consistent with SOA	75%	1	2	3	4	5	Maturity: 1. Unstructured 2. Documented 3. Managed 4. Enhanced 5. Optimized
Service visibility characteristics consistent with SOA	47%	1	2	3	4	5	
Service interaction characteristics consistent with SOA	33%	1	2	3	4	5	
Service 'Real World Effects' consistent with SOA	50%	1	2	3	4	5	
Service interaction policies consistent with SOA	50%	1	2	3	4	5	
Service execution context consistent with SOA	30%	1	2	3	4	5	
OPEN	48%	← 1 2 3 4 5 →					Selected 160 of 936 NESI ?'s
		0-20%	21-40%	41-60%	61-80%	81-100%	
Architecture Context	75%	1	2	3	4	5	Compliance: 1. No Evaluation (Required line code review or unavailable data) 2. No Compliance 3. Low Compliance 4. Some Compliance 5. Complete Compliance
Registration	30%	1	2	3	4	5	
Interface Definition	47%	1	2	3	4	5	
Visibility	54%	1	2	3	4	5	
Discoverability	25%	1	2	3	4	5	
Policy & Governance	49%	1	2	3	4	5	
Interoperability	45%	1	2	3	4	5	
SOA Open Principles	51%	1	2	3	4	5	
Security	53%	1	2	3	4	5	

Summary of Findings

► Conclusions

- DCGS-IC PoC is SOA enough. *As SOA as it can be given funding and time.*
- The DCGS Integration Backbone (DIB) 1.2 portion of DCGS-IC is not open enough
- The *requirements* for DCGS-IC continue to be refined
- Overall DCGS-IC is following industry and DoD SOA best practices (*as few as exist*)
 - Best practices are still evolving, some implementations and approaches still assume to be in a controlled well-defined enterprise and not across organizations where boundaries are still evolving

DCGS-IC is exemplar of SOA in the IC

► Recommendations

- Communicate how the DIB will be used to cross organization boundaries IAW SOA principles (i.e. DIB to DIB or DIB to other agency services)
- Increase funding to capture appropriate level of information and documents in accessible location to conform to SOA principles.
 - Need to reflect critical knowledge needed to support a mature SOA implementation
 - Investigate mechanisms to automate service description updates
 - Invest in the software adjuncts needed to make the usage logs available, auditable and secure
- Coordinate with DDNI to ensure Service Discoverability mechanisms are provided and incorporated in the next release.

Develop and provide a clear vision of the desired outcome



Summary of Findings (Cont'd)

▶ Recommendations (cont'd)

- Long Term High Priority develop and provide Repeatable Acquisition Strategies, Deliverables and Language
 - Develop an approach to keep government and contracting partners informed on how evolving standard will be tracked, changes evaluated, and implemented.
 - Continue and refine workflow and business process analysis as specs to contractors that ensures implementations meets needs

- Provide additional artifacts to align business process to DCGS-IC use cases.
 - Identify and expand DCGS-IC specific actions to support mission focus use cases
 - Specify where DCGS-IC business functions enable mission focused use cases. For example, further investigate service management mechanisms, tools, and capabilities for traceability and repeatability
 - Once expanded, conduct review and consideration.....

- Migrate to new version (1.3?) of the DIB and ensure “Open-ness” based on NESI checklists.

- Follow-up with more detail inspection of code to verify “SOAness” and “Open-ness”

BACKUPS

References

- ▶ “SOA-ness” was defined using the OASIS reference model v1.0, 7 Feb 2006
- ▶ “Open-ness” was defined using the ASD/NII Checklist Guidance Net Centric Implementation Framework v2.0 30 April 2007

Standards and References require further definition
and
The development of an Acquisition Checklist of Program Managers

Methods and Approaches

- ▶ Based on an overall score of 532, the DCGS-IC received an “Open-ness” value of 258 (48%)
 - The overall score is derived from applying the 54 NESI criteria used in the survey across the 9 evaluation categories (many questions are applicable to multiple categories)
 - A number of the questions (11) required detailed code review that was not performed during the limited time of this study. In the scores mentioned above, these questions were given a value of 0 or no compliance, however, the estimation of non-compliance may understate the actual condition of that criteria. Therefore the applied score is a conservative worst-case estimation of the open-ness of DCGS-IC
 - To provide an upper bound on the estimate an alternate score was calculated where those criteria that require code review were removed from the evaluation. In that scenario, the maximum possible score among all categories dropped to 456 with the evaluation score of 258 remaining constant (58%) – However, the charts on the “Findings” slide represent the conservative ratings based on the overall score of 532.

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Existing SOA Measurements

- ▶ Literature Searches on “SOA Measurement”
 - Commercial Services “Alert Site” continuously monitor SOA for performance (Availability, Speed and Execution Success)
 - On going literature on SOA Efficiency defined as
 - bandwidth and power used divided by cost
 - Uptime, service availability and speed
 - Cost over increased value or transaction value
 - More complex models evaluate
 - Customer side Effectiveness, Capability & Value Creation
 - Server side, Efficiency, Capacity & Sustainability

- ▶ No Measurements or schema found for “SOA-ness”.